

The Miller Ratio (MR): A Tool For Practitioners And Regulators To Detect For The Possibility Of Earnings Management (EM)

James E. Miller, Gannon University, USA

ABSTRACT

The implications of the study of the MR (Miller Ratio) are the possibilities of, with future research support, the MR being both a beneficial, and easy to use, tool for practitioners and regulators to detect for the possibility of EM (earnings management). The previously studied models were not designed to be utilized on a case-by-case basis since they were studied using large samples of firms in an attempt to make generalized statements about the effectiveness of the models. The MR, designed to be utilized on a case-by-case basis, is easily computed. If corporate managers were aware of this simple, easy-to-use tool to detect EM, they may be more cautious of engaging in this activity. Essentially, the MR could assist practitioners and regulators in prioritizing their work load of companies to analyze. It is another arrow in their quiver, so to speak.

INTRODUCTION

The implications of the study of the MR (Miller Ratio) are the possibility, with future research support, that the MR can be beneficial and easy to use on a case-by-case basis for practitioners and regulators to detect the possibility of EM (earnings management). Most practitioners and regulators, particularly the SEC (Securities and Exchange Commission), review EM on a case-by-case basis (Giroux, 2004). The models discussed in Miller (2007) were studied using a large sample of firms in the aggregate. The previously studied models were not designed to be utilized on a case-by-case basis since they were studied using large samples of firms (Giroux, 2004) in an attempt to make generalized statements about the effectiveness of the models. The MR, however, was designed to be utilized on a case-by-case basis, and is easily computed. The results could be of potential benefit to the investing public by being presented with more transparent financial information. This benefit could address the matter mentioned by former SEC Chairman Levitt indicating his belief that financial reporting was descending “into the grey area between illegitimacy and outright fraud” (Schroeder, et al., 2005, p. 17). Therefore, if corporate managers are aware of a simple, easy-to-use tool to detect EM, they may be more cautious of engaging in EM.

As suggested in Miller (2007), the research would utilize a data set whereby the specific restatement period is known, whether annual or quarterly, overcoming a limitation of that study. Therefore, this study was performed with quarterly information to ascertain volatility within the shortest SEC required reporting periods. As discussed in Miller (2007), the MJM (Modified Jones Model) was designed to be examined using large groups of data. The MR was designed to be used on a case-by-case basis. Also, since the data for the MJM computation is complex and expensive to obtain, and the data for the MR can be readily obtained from <http://www.sec.gov/edgar/searchedgar/companysearch.html>, the MR is the focus of this paper. In addition, the simplicity of the MR, as compared to the MJM, as shown below, causes the study of the MR to be readily performed.

- **Modified Jones Model:**

$$EDAC_{it} = [(\Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} - Dep_{it}) / (A_{it-1})] - [a_{it}(1 / A_{it-1}) + b_{it}((\Delta REV_{it} - \Delta AR_{it}) / A_{it-1}) + b_{it2}(PPE_{it} / A_{it-1})]_{t-0} - [(\Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} - Dep_{it}) / (A_{it-1})] - [a_{it}(1 / A_{it-1}) + b_{it}((\Delta REV_{it} - \Delta AR_{it}) / A_{it-1}) + b_{it2}(PPE_{it} / A_{it-1})]_{t-1}$$

- **Miller Ratio:**

$$EDAC = (\Delta wc/cfo)_t - (\Delta wc/cfo)_{t-1}$$

Where,

$EDAC_{it}$ = Estimated discretionary accruals for firm i in year t ,

ΔCA = change in current assets,

ΔCL = change in current liabilities,

$\Delta Cash$ = change in cash and cash equivalents,

ΔSTD = change in debt included in current liabilities,

Dep = depreciation and amortization expense,

A = Total assets,

REV_{it} = Change in revenue for firm i from year $t-1$ to year t ,

ΔAR_{it} = Change in accounts receivable for firm i from year $t-1$ to year t ,

PPE_{it} = Gross property, plant, and equipment for firm i in year t ,

“ i ” refers to the firm or the industry depending on whether the analysis is time series or cross-sectional,

$\Delta wc/cfo$ = change in working capital divided by cash flow from operations.

EM manipulations can be either accounting-based or operations-based in nature (Crumbley, et al., 2003). Accounting-based EM manipulations include for example, changing accounting methods; increasing earnings to meet a budget target; or change in accounting estimates. These can include bad debt reserves, life of depreciable assets, and inventory obsolescence. Accounting-based EM is a violation of the decision-specific quality intended by the matching principle, whereby expenses are to be recognized in the same period as related revenues (Spiceland, et al., 2004). Operations-based EM manipulations may include: accelerating production; accelerating sales; or stockpiling excessive inventory not needed until well into the following year.

Accruals affect balances in certain balance sheet accounts such as accounts receivable, inventory, and accounts payable, along with other possible accrued asset and liability accounts. The offset to affecting balances in balance sheet accounts is reflected in an income or expense account (Hornsgren, et al., 2002). The basic simplicity of double-entry accounting permits EM activities; but it is also that simplicity which exposes the problem when the activity must be perpetuated.

Chou, et al., (2006) also make reference to short-term accruals as being easier to manage since accounting choices associated with short-term accruals are made over shorter periods of time. They state that short-term accruals are accounting choices with adjustments to short-term assets, such as the change in accounts receivable. Visvanathan (2006) clearly defines the composition of TA (total accruals) as current accruals and long-term accruals (depreciation, deferred taxes); and current accruals are composed of change in accounts receivable, change in inventory, change in accounts payable and accrued liabilities, change in accrued income taxes, plus change in other current assets and current liabilities.

Accruals can be manipulated (earnings management) during the short-term, but these amounts will eventually reverse themselves. Accrual accounting provides the ability to manipulate net income by aggressive recording of revenues or postpone recording of expenses with offsetting entries to the various accounts comprising working capital. Therefore, it would appear that a relationship between the change in working capital and cash flow from operations would be an indicator of earnings management. If a firm was not engaging in aggressive earnings management, the relationship would be stable. Consequently, a trend of the relationship, with a slope not equal to zero, would indicate possible earnings management activity. Therefore, the volatility of the ratio $\Delta WC/CFO$ (the *Miller Ratio*) can be an indicator of the possibility of earnings management.

Consideration was given to viewing the ratio of earnings quality in an attempt to correlate the significance of earnings quality with the *Miller Ratio*. However, it was decided to perform this in a future paper. The accepted definition of earnings quality is net income divided by cash flow from operations (Spiceland, et al, 2004). To enhance predictive value, analysts try to separate a company's transitory earnings effects from its permanent earnings. Transitory earnings effects result from transaction or events that are not likely to occur again in the foreseeable future or that are likely to have a different impact on earnings in the future. Thus, analysts begin their assessment of permanent earnings with income from continuing operations. The elements that comprise transitory earnings are components of income required to be disclosed separately. Thus, both the earnings quality ratio and the *Miller Ratio* contain the same denominator. The earnings quality has been accepted to be a ratio of how closely cash flow correlates with net income over time. Financial analysts must be alert to the effect of discretionary accruals on income, which has an impact on earnings quality assessments (Spiceland, et al., 2004). EM is a practice that negatively impacts earnings quality. Since DA (discretionary accruals) affect income from operations, through accruals to working capital accounts, the earnings quality relationship is distorted. A stable relationship is expected, and when it is not stable, the quality of earnings decreases as a predictor of future permanent earnings. Since working capital accruals are reversed in the next accounting period, to the extent that management is aggressive in their discretion of accruals, management can manipulate income between periods, or they must perpetuate the situation if business events that necessitated the DA do not change. This consideration provides the connection between ΔWC and CFO, which leads to the MR model to be studied.

A study of the *Miller Ratio* was conducted with data utilizing the aforementioned suggestion of quarterly data. The specific companies identified for the project was obtained from the United States General Accounting Office "Report to the Chairman, Committee on Banking, Housing, and Urban Affairs, U. S. Senate" covering the years 1997 to 2002 that were cited for various accounting manipulations. The specific variables namely, current assets, current liabilities, and cash flow from operations were obtained from the data available on <http://www.sec.gov/edgar/searchedgar/companysearch.html>.

Figure 1

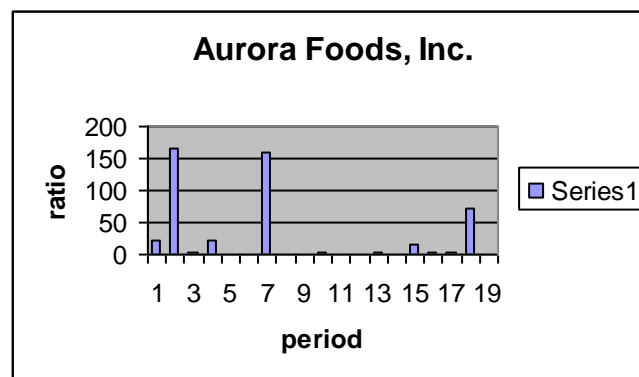


Figure 1 displays the bar graph of Aurora Foods, Inc. of the value of the *Miller Ratio* for the quarterly periods from the 1st quarter of 1999 thru the 3rd quarter of 2003. The General Accounting Office had sanctioned Aurora Foods, Inc. for understating current liabilities and overstating current assets for the year 1999. This sanction corresponds with the first four periods identified in Figure 1, with the peak indicated in the second period. The peak indicated in the seventh period corresponds with an apparent response to a decrease in stock price from \$8.94/share to \$3/share in order to salvage market value.

Figure 2

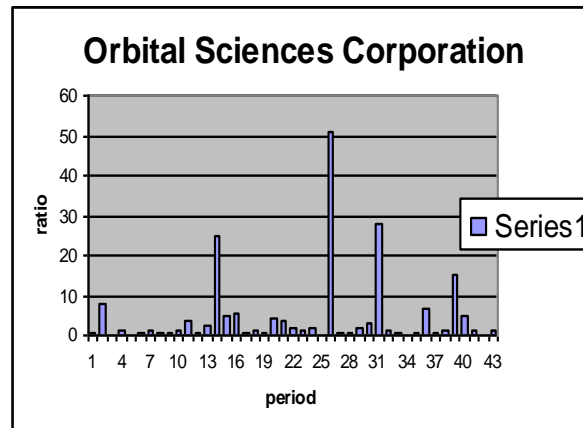


Figure 2 displays the bar graph of Orbital Sciences Corporation of the value of the *Miller Ratio* for the quarterly periods from the 1st quarter of 1995 thru the 3rd quarter of 2005. The General Accounting Office had sanctioned Orbital Sciences Corporation for excessively capitalizing costs and aggressive revenue recognition for the years 1998 and 1999. This sanction corresponds with the peak indicated in period 14, which is the second quarter of 1998. The peak indicated in the 26th period corresponds with an apparent response to a decrease in stock price from \$45/share to less than \$10/share in an apparent attempt to regain market value.

Figure 3

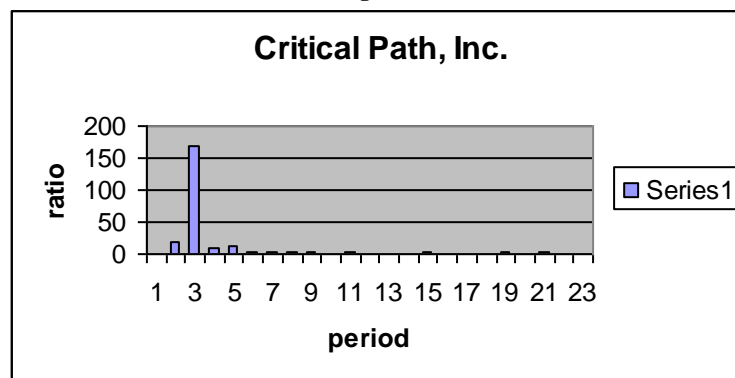


Figure 2 displays the bar graph of Critical Path, Inc. of the value of the *Miller Ratio* for the quarterly periods from the 1st quarter of 1999 thru the 3rd quarter of 2004. The General Accounting Office had sanctioned Critical Path, Inc. for aggressively boosting revenues and reducing costs for the year 2000. The share price in the second quarter of 1999 had been \$116.75/share, dropping to \$0.26/share by the third quarter of 2001. The peak indicated in the third period, which corresponds with the third quarter of 1999, was an apparent attempt to stop the decline in market value, resulting in being sanctioned for the year 2000.

Figure 4

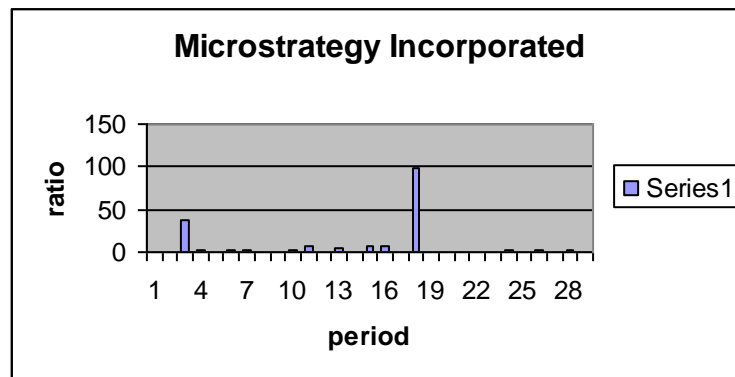


Figure 4 displays the bar graph of Microstrategy Incorporated of the value of the *Miller Ratio* for the quarterly periods from the third quarter of 1998 to the third quarter of 2005. The General Accounting Office had sanctioned Microstrategy Incorporated for certain revenue recognition issues for the year 1999. The peak indicated in the third period corresponds with the first quarter of 1999. The peak indicated in the 18th period corresponds with an apparent response to a decrease in stock price of \$313/share in the first quarter of 2000 to \$0.47/share in the third quarter of 2002 in an apparent attempt to regain market value.

The brief study discussed herein offers the possibility the *Miller Ratio* could indicate a more detailed analytical review should be made of the company's financial statements, particularly the accounts that comprise the *Miller Ratio*. Essentially, the MR could assist practitioners and regulators in prioritizing their work load of companies to analyze. It is another arrow in their quiver, so to speak. A study of four companies does not establish the validity of the *Miller Ratio* to detect for the possibility of earnings management. However, the findings discussed indicate that there is sufficient reliability in the *Miller Ratio* to justify further study.

REFERENCES

1. Chou, D., Gombola, M., & Liu, F. (2006). Earnings management and stock performance of reverse leveraged buyouts. *Journal of Financial and Quantitative Analysis*, 41(2), 407-438.
2. Crumbley, Cr. FA, D., Heitger, L., Smith CPA, L. E., & Stevenson, G. (2003). In Anonymous, *Forensic and Investigative Accounting*. Chicago: CCH Incorporated.
3. Giroux, Gary (2004). *Detecting Earnings Management*. Hoboken, NJ: John Wiley & Sons, Inc.
4. Horngren, C. T., Harrison, Jr., W. T., & Bamber, L. S. (2002). *Accounting* (5th ed.). Upper Saddle River, NJ: Prentice-Hall.
5. Miller, James E. (2007). *Detecting Earnings Management: A Tool for Practitioners and Regulators*. (Doctoral Dissertation, Anderson University).
6. Schroeder, R. G., Clark, M. W., and Cathey, J. M. (2005). *Financial Accounting Theory and Analysis, text reading and cases* (8th ed.). Hoboken, New Jersey: John Wiley & Sons, Inc.
7. Spiceland, J. D., Sepe, J. F., Tomassini, L. A. (2004). *Intermediate Accounting* (3rd ed.). New York: McGraw-Hill Higher Education.
8. Visvanathan, G. (2006). An empirical investigation of 'closeness to cash' as a determinant of earnings response coefficients. *Accounting and Business Research*, 36(2), 109-120.

NOTES